## APPENDIX C - PLUGGING AND ABANDONMENT PLANS

Upon completion of injection activities, a well will be plugged and abandoned according to the following plans and to State and Federal regulations to ensure protection of Underground Sources of Drinking Water (USDW).

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United States Environmental Protection Agency Washington, DC 20460														
PLUGGING AND ABANDONMENT PLAN														
			FLUC		l N	ame	and Addres	s of Owner/C	perator					
	and Address of Faci		oility			Cou	inty of Maui	- Departme	ent of Public	Works and	Envir. Mg	mt.		
Laha	ina Wastewater Re Honoapiilani Hw	y., Lahaina, H	Π 96 <b>7</b> 91			200	S. High Str	eet, Wailuk	u, HI 96793					
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	attachments and	that, based on e. accurate. Al	nty mounty	I am aware th	hat there are	sigr	nificant pena	lties for sub	mitting false	information	, including t	ne		
	possibliity of fine	and imprison	ment. (Ref.	40 CFR 144.32							Date Signe			
Nam	e and Official Title	(Please type o	r print)		Signature						Date Signe			
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OMB No. 2040-0042

Approval Expires 1/31/05

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Approval Expires 1/31/05 OMB No. 2040-0042 United States Environmental Protection Agency Washington, DC 20460 **SEPA** PLUGGING AND ABANDONMENT PLAN Name and Address of Owner/Operator Name and Address of Facility County of Maui - Department of Public Works and Envir. Mgmt. Lahaina Wastewater Reclamation Facility 200 S. High Street, Wailuku, HI 96793 3300 Honoapiilani Hwy., Lahaina, HI 96791 Permit Number County State Locate Well and Outline Unit on Maui Hawaii Section Plat - 640 Acres Surface Location Description 1/4 of Section Township 1/4 of 1/4 of Locate well in two directions from nearest lines of quarter section and drilling unit Line of quarter section ft. frm (N/S) Location Line of quarter section. ft. from (E/W) WELL ACTIVITY TYPE OF AUTHORIZATION CLASS I w ✓ Individual Permit CLASS II Area Permit Brine Disposal Rule Enhanced Recovery Number of Wells 1 Hydrocarbon Storage CLASS III s Well Number Lease Name METHOD OF EMPLACEMENT OF CEMENT PLUGS CASING AND TUBING RECORD AFTER PLUGGING HOLE SIZE TO BE PUT IN WELL (FT) TO BE LEFT IN WELL (FT) The Balance Method SIZE The Dump Bailer Method 108 The Two-Plug Method Other PLUG #6 PLUG #7 PLUG #5 PLUG #2 PLUG #3 PLUG #4 PLUG #1 CEMENTING TO PLUG AND ABANDON DATA: 20 Size of Hole or Pipe in which Plug Will Be Placed (inche 18/20 105 Depth to Bottom of Tubing or Drill Pipe (ft Sacks of Cement To Be Used (each plug) 27 Slurry Volume To Be Pumped (cu. ft.) 1 4 Calculated Top of Plug (ft.) Measured Top of Plug (if tagged ft.) 16 Slurry Wt. (Lb./Gal.) 4000 psi | 4000 psi Type Cement or Other Material (Class III) LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any) From 120' will be filled with 3/4" gravel 225 16' will be filled with sand Estimated Cost to Plug Wells \$7,850 Certification I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the Information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

## Name and Official Title (Please type or print)

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#### **Preliminary**

### Lahaina Injection Well Abandonment Plan Method of Abondoning Well

1 Measure Depth of Well

2 All casing shall remain with the exception of the stick up and to a depth of 4 feet below finish ground level.

3 Remove air surge line

- 4 Inflow pipe shall be exposed, cut and plugged
- 5 Fill all open hole with 3/4"gravel

Place two cubic yards of concrete at transition from open hole to solid casing

or

Fill preforated casing with 3/4"gravel

Place two cubic yards of concrete at transition from perforated casing to solid casing.

- 6 Fill soid casing with sand to a point about 16 feet below finish ground (approximately 4 feet below inflow pipe)
- 7 Remove Casing stickup and additional 4 feet below ground surface
- 8 Seal remaining casing with concrete (Approximately 1 C.Y.)

#### Note:

Monitor and record depth and volume of material placement

Verify that no sluffing of material occurs (48 hours) before placing one layer of material over another.

File required reports with EPA, State DOH and DNLR

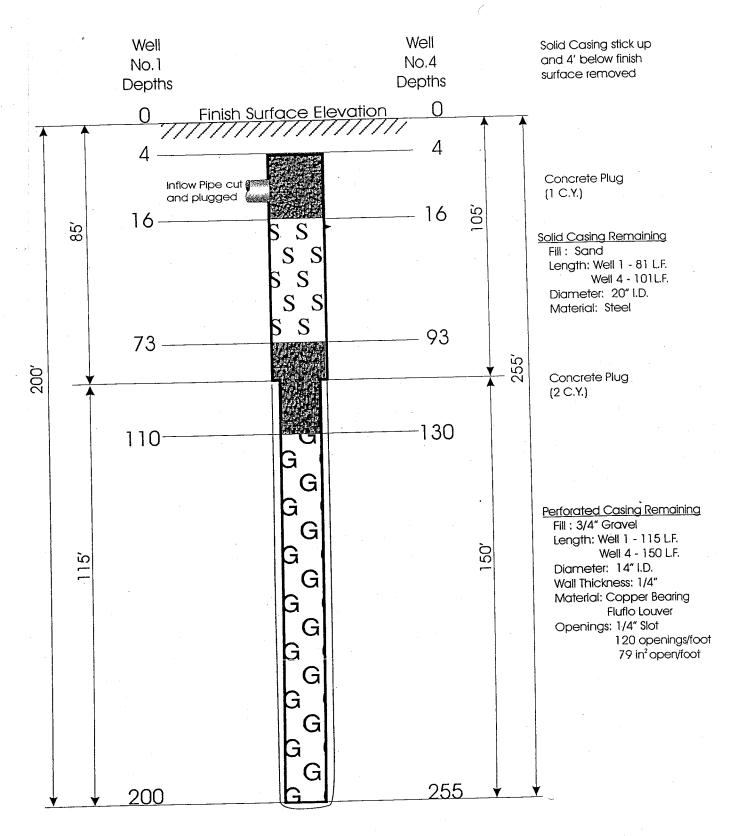
#### **Cost Estimate**

ltom	Unit Cost	Well 1	Well 2	Well 3	Well 4
<u>Item</u>	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
Mobilization	\$75	\$266	\$391	\$514	\$370
3/4" gravel (C.Y.)	\$150	\$450	\$450	\$450	\$450
Concrete (C.Y.)	\$60	\$268	\$273	<b>′\$370</b>	\$370
Sand (C.Y.)	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Monitoring etc.	\$1,500 \$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Well Head Removal etc.	\$500	\$500	\$500	\$500	\$500
Backfill/grading	\$500		\$7,614	\$7,834	\$7,690
Total		\$7,484	Ψ1,014	Ψ1,004	Ψ1,000

## Lahaina Injection Well Abandonment Plan

Well Characteristics Casing Stickup (ft.)	Well 1	Well 2	Well 3	Well 4
Open Hole diameter (in.)	4 0	3 18	3	3
Open Hole height (ft.)	0	95	18 120	0
Perforated Casing diameter (in.)	14	0	0	0 14
Perforated Casing height (ft.)	115	0	0	150
Solid Casing diameter (in.)	20	20	20	20
Solid Casing height (ft.)	88	88	108	108
Well Depth	200	180	225	255
Plug Locations				
Depth to top of Plug 2	4	. 4	4.	4
Depth to inflow pipe	11	11.5	12	12
Depth to bottom of plug 2	16	16	16	16
Depth to top of Plug 1	73	73	93	93
Depth to bottom of solid casing	85	85	105	105
Depth to bottom of Plug 1	110	100	120	130
Bottom depth	200	180	225	255
Fill Volume for one lineal foot	•	•		
Volume of Solid Casing (ft^3)	2.18	2.18	2.18	2.18
Volume of Perforated Casing (ft^3)	1.07	0.00	0.00	1.07
Volume of Open Hole (ft^3)	0.00	1.77	1.77	0.00
CEMENT PLUGS				•
Solid Casing Plug length (2 C.Y.)	24.75	24.75	24.75	24.75
Perforated Casing Plug length (1 C.Y.)  Open Hole Plug Length (1 C.Y.)	25.26	0.00	0.00	25.26
Open Hole Flug Length (1 C.1.)	0.00	15.28	15.28	0.00
OTHER MATERIALS				
Solid Casing Sand Length (ft.)	55.25	56.25	76.25	76.25
Perforated Casing Gravel length (ft.)	89.74	0.00	0.00	124.74
Open Hole Gravel Length (ft.)	0.00	79.72	104.72	0.00
Total Length Filled	195.00	176.00	221.00	251.00
Stick up and casing removal	8.00	7.00	7.00	7.00
Total Well Depth	203.00	183.00	228.00	258.00
			•	
1 C.Y. of material will fill:				
Solid Casing length (ft.)	12.38	12.38	12.38	12.38
Perforated Casing length (ft.)	25.26	0.00	0.00	25.26
Open Hole length (ft.)	0.00	15.28	15.28	0.00
Fill Material Required				
Volume of Concrete Required (C.Y.)	3.00	3.00	3.00	3.00
Volume of Sand Required (C.Y.)	4.46	4.54	6.16	6.16
Volume of Gravel Required (C.Y.)	3.55	5.22	6.85	1
( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	0.00	J.22	0.00	4.94

# Lahaina Wastewater Reclamation Facility Well Abandonment Plan Injection Well No.'s 1 and 4



# Lahaina Wastewater Reclamation Facility Well Abandonment Plan Injection Well No.'s 2 and 3

